

UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No. 35.C13886

First Named Inventor or Application Identifier

HARUO MACHIDA

Express Mail Label No.

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

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Signed Statement attached deleting inventor(s)
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8. ☐ Assignment Papers (cover sheet & document(s))
9. ☐ 37 CFR 3.73(b) Statement ☐ Power of Attorney
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	TOTAL CLAIMS (37 CFR 1.16(c))	88-20 =	68	X \$ 18.00 =	\$1,224.00
	INDEPENDENT CLAIMS (37 cfr 1.16(b))	11-3 =	8	X \$ 78.00 =	\$ 624.00
	MULTIPLE DEPENDENT CLAIMS (if applicable) (37 CFR 1.16(d))			\$260.00 =	\$ 0.00
				BASIC FEE (37 CFR 1.16(a))	\$ 760.00
	Total of above Calculations =				\$2,608.00
	Reduction by 50% for filing by small entity (Note 37 CFR 1.9, 1.27, 1.28).				
	TOTAL =				\$2,608.00

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- a. ☒ Fees required under 37 CFR 1.16.
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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

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SIGNATURE	Joseph W. Ragusa 38,586
DATE	September 28, 1999

SYSTEM FOR DISPLAYING CONNECTION CONDITION
OF DEVICE PROVIDED ON NETWORK

BACKGROUND OF THE INVENTION

5 Field of the Invention

The present invention is related to a system for managing a peripheral device provided on a network.

Related Background Art

10 In recent, various systems have been proposed in which a peripheral device such as a printer, a scanner, or a modem is commonly used, or shared on a network such as a LAN.

15 Since the above peripheral devices are commonly used on such a network, a total cost thereof may be reduced, as well as areas for installing these peripheral devices may be minimized, which are advantageous.

20 However, in such a commonly-used network system, these peripheral devices are often located at places apart from the places where users are actually working. As a result, the following difficulties occur. The users can hardly grasp which peripheral device is actually connected on the network. Also, the users can
25 grasp the using statuses of these peripheral devices only after documents are actually printed out and images are actually read.

Furthermore, since the connection information etc.
about these peripheral devices are separated for every
device, the user must every time check these connection
statuses of each kind of these peripheral devices. As
5 a result, operation thereof is hard to understand as
well as very troublesome, which causes the
deterioration of the work efficiency.

Also, a similar problem occurs even in such a case
where a peripheral device is commonly used on a network
10 but is not directly connected on this network, and is
locally connected to a terminal device such as a
personal computer.

SUMMARY OF THE INVENTION

15 The present invention has been made to solve the
above-explained conventional problems, and therefore,
has an object of the invention to provide such a
network system capable of increasing the efficiency of
a work that is carried out using a peripheral device
20 commonly used on a network.

Another object of the present invention is to
provide a network system in which a user of a terminal
on a network can readily grasp a peripheral device that
is commonly used on the network.

25 Still another object of the present invention is
to provide a network system in which a user of a
terminal on a network can readily grasp the status of a

peripheral device that is commonly used on this network.

Yet another object of the present invention is to provide a network system in which a user of a terminal
5 on a network can readily grasp a peripheral device that is locally connected to another terminal and is available to use commonly.

Further another object of the present invention is to provide a network system in which a user of a
10 terminal on a network can readily grasp the status of a peripheral device that is locally connected to another terminal and is available to use commonly.

BRIEF DESCRIPTION OF THE DRAWINGS

15 Fig. 1 is a block diagram showing an example of an arrangement of a terminal device according to embodiments of the present invention;

Fig. 2 is a flow chart describing an operation example of a terminal device according to a first
20 embodiment of the present invention;

Fig. 3 illustratively indicates an example of a display screen of the terminal device according to the first embodiment of the present invention;

Fig. 4 illustratively shows an example of a data
25 structural example of information acquired by the terminal device according to the first embodiment of the present invention;

Fig. 5 illustratively represents an example of a display screen for setting an information update schedule in the first embodiment of the present invention;

5 Fig. 6 illustratively indicates the structure of a network system according to a second embodiment of the present invention;

10 Fig. 7 is a block diagram indicating an internal structure of a terminal device that selects an image reading device in the network system according to the second embodiment of the present invention;

15 Fig. 8 is a structural diagram representing an example of a display screen of the terminal device that selects the image reading device in the network system according to the second embodiment of the present invention;

20 Fig. 9 is a flow chart explaining operations of the selecting terminal device in the network system according to the second embodiment of the present invention;

25 Fig. 10 is a block diagram indicating internal structures of an image reading device and a terminal device that selects the image reading device in a network system of a third embodiment of the present invention;

Figs. 11A and 11B are flow charts explaining operations of the terminal device that selects the

image reading device in the network system according to the third embodiment of the present invention; and

Fig. 12 is a flow chart describing operations of the terminal device to which the image reading device is locally connected in the network system according to the third embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to drawings, an embodiment of the present invention will be described in detail.

Fig. 1 is a schematic block diagram indicating an arrangement of a terminal device according to embodiments of the present invention.

In this drawing, reference numeral 1 denotes a system bus. Structural blocks (discussed later) are connected to this system bus 1. Reference numeral 2 indicates a CPU (Central Processing Unit).

Reference numeral 3 denotes a program memory (hereinafter referred to as "PMEM"). A program required to execute this process operation is properly selected/read out from a hard disk (unit) 10, and is once stored into this program memory 3 so as to be executed under control of the CPU 2. Also, data entered via a keyboard 12 is stored as code information into the PMEM 3 that also functions as a text memory.

Also, reference numeral 4 shows a communication controller, and this communication controller 4

controls input/output data in a communication port 5. A signal outputted from the communication port 5 is transmitted via a communication line 6 to another communication port of another device 7 provided on the network. Image data are transmitted/received via the above-explained communication controller 4 between a printer 18 and an image reading device 1B, which are commonly used, or shared on the network.

It should be noted that in this first embodiment, the network such as a LAN is described as the above-explained communication line 6, however, the network system of the present invention may be applied to even such a case where both the communication port 5 and the communication line 6, connected to this communication controller 4, are general-purpose public lines.

Also, reference numeral 8 shows an external storage controller, and reference numerals 9 and 10 represent data filing disks. For instance, reference numeral 9 shows a floppy disk (hereinafter referred to as "FD"), and reference numeral 10 indicates a hard disk (hereinafter referred to as "HD").

Further, reference numeral 11 shows an input controller. An input device such as a keyboard 12 and a mouse 13 is connected to this input controller 11. An operator manipulates this keyboard 12 so as to instruct operations of the network system.

Also, reference numeral 13 represents a pointing

device (hereinafter referred to as "PD") used to
instruct processing of image information on a CRT 16.
In this first embodiment, the mouse is used as this
pointing device. As a result, the operator may
5 arbitrarily move the cursor displayed on the CRT 16 in
an X direction and a Y direction and may select a
command icon displayed on a command menu so as to
instruct a process operation. Furthermore, the
operator may instruct an editing object, and a drawing
10 position.

Reference numeral 14 shows a video image memory
(hereinafter referred to as "VRAM"), reference numeral
15 indicates a display output controller, and reference
numeral 16 represents a CRT (cathode-ray tube). The
15 data displayed on the CRT 16 is expanded as bit map
data on the VRAM 14. Reference numeral 17 shows a
printer controller. When a printer 18 is connected to
the printer controller 17, this printer controller 17
controls this printer 18 to output data.

20 Reference character 1A denotes an image reading
device controller for controlling an image reading
device 1B connected thereto. As the terminal device
according to this first embodiment, both the image
reading device controller 1A and the image reading
25 device 1B are employed. As previously explained, in
the terminal device on the side of the client, the
above-explained image reading device controller 1A and

image reading device 1B may be used which are commonly used via the communication controller 4 and the communication port 5, and are provided on the side of the server terminal.

5 Furthermore, the arrangement of the network system shown in Fig. 1 may have similar functions even in such a case that an image reading device 1B and the terminal device will constitute physically separate components from each other, and furthermore, the terminal device
10 will constitute such a single component containing the image reading device 1B.

It should be noted that the program stored in the program memory 3 in this first embodiment may be stored in a storage medium such as a hard disk (HD) and a
15 floppy disk (FD), which are directly connected to the terminal device. Alternatively, this program may be stored in another device connected via the network.

Also, the program employed in this first embodiment may be supplied to the storage medium such
20 as the FD 9 and the HD 10, and a system via a network, and also a device via a network.

(First embodiment)

Fig. 2 is a flow chart describing operations of the terminal device according to a first embodiment of
25 the present invention.

As indicated in the flow chart of Fig. 2, domain information on the network to which the own terminal

device is connected is acquired under control of the CPU 2 at a first step S201.

At the next step S202, connection information of computers (PCs) connected to the respective domains is
5 acquired.

At the next step S203, connection information of peripheral devices connected to the computers acquired at the previous step S202 is acquired.

Thereafter, using statuses of the above-described
10 computers and peripheral devices are acquired at a step S204. Then, the acquired information is stored in either the memory 3 or the hard disk 10.

Fig. 4 illustratively shows an example of a data structure obtained in such a case that the connection
15 information and the using statuses acquired at the above-explained steps S203 and S204 are stored in the hard disk and the like. As domain information 41, there are provided name data 41a, attribute data 41b, comment information 41c, and information 42 of the
20 connected computer.

In this case, when a plurality of computers are connected to this domain, this domain owns a plurality of computer information, a total number of which is equal to a total number of the above-explained
25 computers. The computer information 42 contains name data 42a, attribute data 42b, comment information 42c, and information 43 about the connected peripheral

devices.

Also, in this case, when a plurality of peripheral devices are connected to this computer, this computer owns a plurality of peripheral device information, a
5 total number of which is equal to a total number of the above-explained peripheral devices. The peripheral device information 43 contains name data 43a, attribute data 43b, comment information 43c, status information 43d, and other management information 43e. It should
10 be understood that structures of information may be slightly different from each other, depending upon the sort of peripheral devices and functions thereof.

Based upon the information acquired at the above-explained step S205, the connection information and the
15 using statuses about all of the computers and peripheral devices, which are connected to the network, are displayed on the display screen of the CRT 16.

Fig. 3 illustratively shows a display example in the case where both the connection information and the
20 using statuses about the computers and also the peripheral devices are displayed on the CRT 16. In this drawing, reference numeral 301 indicates a window for representing the connection information and the using statuses of all of the devices provided on the
25 network.

Various operations may be carried out by employing the devices displayed on this display screen. In Fig.

3, reference character 302a shows a copy machine,
reference character 302b indicates a FAX machine,
reference character 302c represents a scanner,
reference character 302d is a printer, and reference
5 character 302e shows an OCR (optical character
recognition).

Also, reference character 302f represents a button
of a display switching function. When this display
switching button 302f is clicked, thumbnail
10 display/detail display may be switched. Furthermore,
reference character 302g is an information update
function button. When this information update function
button 302g is operated, both the connection setting
information and the using status information about all
15 of the devices provided on the network may be updated.

In this drawing, reference numeral 303 shows a
domain. Although only one domain 303 is indicated in
this display example, when there are plural domains,
all of these domains are indicated.

20 Also, reference character 304a shows a server
machine of this domain 303. Reference character 304b
indicates the own computer machine. Reference
characters 304c, 304d, 304e, 304f, 304g, and 304h
represent other computers connected to the same domain
25 304, respectively. Also, reference numeral 305 is a
modem.

In this display case, a mark, a mesh, and a

display shape located at an upper left portion
represent a present using status. In this case the
mark indicated on the upper left portion shows "under
communication", and a portion where an inclined-line
5 mesh is made indicates such a fact that other machines
are under use.

Reference characters 306a, 306b, 306c, 306d, and
306e represent scanners, respectively. The upper left
marks 306c and 306f indicate "under scanning",
10 respectively. Another grey mesh of a device shows such
a fact that this device is presently usable. Also,
reference characters 307a, 307b, and 307c show
printers. An upper left mark of the printer 307a shows
that this printer owns a specific function. As this
15 specific function, there are a color printing function,
and a staple function or the like.

An upper left mark of the printer 307c indicates
"under printing". A device having no mesh such as the
printer 307b indicates such a fact that this device is
20 not presently usable because a driver program is not
installed in this device.

Furthermore, a rectangular shape of the printer
307a is indicated by a dual line, which implies that
this device is equipped with a composite function such
25 as a printer and also a scanner. As the using statuses
of the respective devices, many other using statuses
are conducted in this embodiment. For instance, there

are such using statuses that although a device is connected to the network, this device is not allowed to be used, and although a printer is operable, a large number of printing jobs are waited for being executed.

5 In this example, as to the upper left marks and also the rectangular shapes indicative of the devices, the simple marks and the rectangular shapes indicative of the devices are merely varied. Alternatively, the following display method may be conceived. For
10 example, in the case of a scanner, this scanner owns a plurality of display images. Then, these display images may be arbitrarily switched during the scanning operation, and furthermore, the scanner may be scanned by employ moving picture data. Also, further detailed
15 information may be displayed by pointing out the subject while designating by the mouse 13 in all of the devices.

 At the next step S206, the terminal device judges whether the display operation is ended, or either the
20 present connection information or the using status information is required to be acquired. As to this judging method, the below-mentioned judging methods may be considered.

 As a first judging method, while a predetermined
25 time schedule is saved, the CPU 2 judges whether or not the present time instant is scheduled by this time schedule. That is, in this judging method, the user

sets a read setting time instant on the display screen,
or sets a read time interval on this display screen.

When the present time instant reaches the set time, all
of the information provided on the network is again

5 checked, and when either the connection setting
condition or the using statuses are changed, the
information is again acquired so as to update the
previous information.

As the second judging method, a process for
10 monitoring the network is initiated. While the
connection setting conditions and the using statuses on
the network are continuously monitored, where there is
a change in these connection setting conditions and the
using statuses, information is again acquired so as to
15 update the previously acquired information.

Also, as the third judging method, a button used
to again acquire information is prepared on the display
screen. Since the user instructs this button, the
information provided on the network at this stage may
20 be acquired so as to update the previously acquired
information. The information update function button
302g shown in Fig. 3 corresponds to this button.

Fig. 5 illustratively shows an example of an
information update/setting screen. In Fig. 5,
25 reference numeral 51 indicates a setting screen, and
reference numeral 52 represents a button for
automatically updating information in the case that the

process for monitoring the network is initiated and there is a change in the connection setting condition and the using statuses.

Also, reference numeral 53 shows a button for
5 updating information at a designated time instant.
Reference numeral 54 indicates a button for updating
information when present time reaches the designated
time. Reference numeral 55 represents a button used to
update information in such a case that while the
10 information is not automatically updated, the user
instructs updating of this information on the display
screen.

(Second embodiment)

Now, a description is made of a system, according
15 to a second embodiment of the present invention, in
which an image reading device locally connected to a
terminal device provided on a network is commonly used
on this network. A terminal device on the network may
acquire a list of such terminal devices locally
20 connected to other terminal devices, and then may
select a desirable image reading device from this list.

Fig. 6 schematically shows an arrangement of a
network system according to the second embodiment.

In Fig. 6, reference character 6a shows a network,
25 reference character 6b indicates a terminal device
(hereinafter referred to as "selecting device") for
selecting an image reading device used by a user on

this network 6a. Terminal devices 6c, 6d, 6e, and 6f are provided on the network 6a. To these terminal devices 6c, 6d, 6e, image reading devices 6g, 6h, 6i are connected which are available to use commonly. In other words, the respective image reading devices 6g, 6h, 6i are connected to the terminal device 6b as a shared resource (commonly used resource). It is now assumed that both the above-described image reading device and terminal device will constitute an image reading apparatus.

The structural arrangements of the above-explained terminal devices 6b, 6c, 6d, 6e, 6f are identical to these of the terminal devices shown in Fig. 1.

Fig. 7 schematically indicates an arrangement of an internal function of the terminal device 6b.

In Fig. 7, reference character 3a is a network communication function for processing all of network communications of this device. Reference character 7b shows a detecting function for detecting the image reading devices 6g, 6h, 6i of Fig. 6. Reference character 7c shows a saving function for saving the image reading device detected by the detecting function 7b in a storage area 7d. As a result, the image reading devices 6g, 6h, 6i of the commonly-used image reading apparatus are saved in the list of a storage area 7d.

Reference character 7e indicates an acquiring

function for acquiring current using statuses of the
image reading devices 6g, 6h, 6i registered in the
image reading apparatus list saved in the storage area
7d. Although there is no limitation in the sort of
5 using statuses, various using statuses may be
conceived, for example, "available" "busy", "power
OFF", "not available due to security". In the case of
Fig. 6, the image reading device 6g is stored as
"available"; the device 6h is stored as "busy"; and the
10 device 6i is stored as "power supply OFF".

Reference character 7f shows a storing function
for storing the information acquired by the acquiring
function 7e into the storage area 7d. Reference
character 7g is a selecting function. This selecting
15 function 7g calls the process operations of the
respective functions 7a to 7h, and acquires the
commonly-used image reading device and the using status
thereof, which are stored in the storage area 7d.
Then, the user selects/displays the selected screen of
20 the image reading device.

Since the process operations of the respective
function units 7a to 7h are timely required when the
selecting function 7g is selected, the network system
is initiated by calling the process operation of the
25 selecting function 7g.

Fig. 8 represents an example for showing the
process operation of the above-explained selecting

function 7g.

In Fig. 8, the commonly-used image reading devices 1 to 3 are displayed on name portions of an image reading device list. As apparent from this representation, the image reading device 1 is "usable", the image reading device 2 is "under use by other users"; and the image reading device 3 is "power supply OFF". Therefore, the user can easily select the immediately operable image reading device.

Fig. 9 is a flow chart describing operations of the terminal device 6b.

First, when the user calls the selecting process of the image reading device, the image reading device on the network is detected at a step S901. At the next step S902, the acquired image reading device is stored in the list. Next, the present information about the respective image reading devices is acquired by using this stored list at a step S904. Thereafter, the acquired information at the step S904 is stored. Then, a screen to be selected by the user is displayed by using the stored information at a step S905.

(Third embodiment)

Next, a third embodiment of the present invention is explained.

In the above-explained second embodiment, the information of all of the image reading devices is acquired by the selecting device 6b. In this third

embodiment, such a function for regularly notifying each information to the selecting device 6b is provided on the side of the image reading device. Also, since this selecting device 6b is provided with another
5 function for acquiring this notification to store this acquired notification, the time required to acquire such information may be shortened. Only different structures from those of the second embodiment will now be described.

10 Fig. 10 is a structural diagram for showing internal functions of each terminal device and each image reading device according to this third embodiment.

Reference numeral 101 is an image reading device,
15 and reference numeral 102 shows a terminal device 6b for selecting one of the image reading devices.

In the image reading device 101, reference character 101a shows a function for notifying the current own status to the respective machines provided
20 on a network. Reference character 101b shows a network communication function.

In the selecting device 102, reference character 102a shows a network communication function for communicating with the communication function 101b of
25 the image reading device 101. Reference character 102b is an acquiring function for acquiring information notified from the image reading device 101. Reference

character 102c shows a storing function for storing the
acquired information into a save area 102d. Reference
character 102e represents a selecting function. This
selecting function 102e is initiated when the user
5 calls a selecting process of an image reading device,
and displays the image reading device and the status
information thereof, which are saved in the save area
102d, on the display screen for selection purposes.

Comparing with the selecting function 7g of the
10 second embodiment, the above-explained selecting
function 102e merely acquires/displays the information
saved in the save area 102d, but does not perform the
retrieve process operation nor the information
acquisition process operation. As a consequence, this
15 selecting function 102e can execute this process
operation in higher speeds.

Next, operations of the terminal device 6b will
now be explained.

Since the image reading device executes only such
20 a process operation for continuously notifying a status
thereof to the respective machines at timing when the
own status is changed, descriptions thereof are
omitted.

Figs. 11A and 11B are flow charts for explaining
25 operations of the terminal device for selecting the
image reading device. A flow chart of Fig. 11A
indicates such a process operation that while the

process operation is initiated in the background process, the information notified from the image reading device is continuously monitored, and when the information is acquired, the acquired information is saved in the save area.

At a step S1101, a determination is made whether or not the notification issued from the image reading device is acquired. When this notification is acquired, this acquired notification is saved in the save area. A step S1103 corresponds to a process operation for determining whether or not the background process operation is accomplished. Until the ending process is selected, the loop process is carried out.

Fig. 11B is such a flow chart for explaining operations when the image reading device is selected by the user. When the image reading device is selected by the user, the information saved at the above step S1102 is acquired from the save area at a step S1104.

Then, at a step S1105, a selection screen of the image reading device is displayed by employing the acquired information. Thereafter, when the user performs the selecting operation of the desirable image reading device from the selecting screen, a set-up operation is initiated so as to use the selected image reading device. Then, this set-up image reading device can be used via the network.

Fig. 12 is a flow chart for explaining operations

of the terminal device to which the image reading device is locally connected, according to the third embodiment.

At a first step S1201, a check is made whether or not an information request is issued from the terminal device on the network. When this information request is issued, the process operation is advanced to a step S1202. At this step S1202, the information of the own apparatus saved in the hard disk is transmitted to the terminal device of the request issuing source. At a step S1203, the information of the image reading device locally connected thereto, which is saved in the hard disk, is transmitted to the above-explained terminal device of the request issuing source. At a step S1204, a status of a peripheral device locally connected to the image reading device is detected, and then the detected status is sent to the terminal device of the request issuing source.

It should be noted that in this flow chart the information is transmitted in response to the request issued from another terminal device. Alternatively, the information may be spontaneously transmitted to the respective terminal devices on the network every time a predetermined time interval has passed.

It should be also noted that the present invention may be applied not only to a system arranged by a plurality of devices (for example, host computer,

interface device, reader, printer), but also to an apparatus constructed of a single device.

While various sorts of devices are operated so as to realize the above-explained functions of the above embodiment modes, a program code of software for
5 realizing the above-explained functions is supplied to either an apparatus connected to these various devices or a computer in a system, and these various devices are operated in accordance with the program saved in
10 the computer (CPU, MPU) of this system, or this apparatus, which may be apparently covered by the technical scope of the present invention.

In this case, the program code itself of the above-described software may realize the functions of the above-explained embodiment modes. In this case,
15 this program code itself, and a means for supply this program code to the computer, for example, a storage medium for storing this program code constitute the present invention. As a storage medium for storing
20 this program code, there are provided a floppy disk, a hard disk, an optical disk, an opto-magnetic disk, a CD-ROM, a magnetic tape, and a non-volatile memory card, and a ROM may be employed.

Not only the functions of the above-described
25 embodiment modes may be realized by executing the program supplied to the computer, but also the functions of these embodiment modes may be realized by

such an OS (operating system) of which program code is operated in the computer, or by executing the supplied program code in conjunction with another application software, which may be covered by the technical scope
5 of the present invention.

Furthermore, after the supplied program code has been stored into a computer function extended board, or a memory employed in a function extended unit connected to the computer, a CPU provided in this function
10 extended board or function extended unit executes a portion of the actual process operation, or the entire portion thereof based on an instruction of this program code, and thus, the functions of the above-described embodiments may be realized by this process operation,
15 which may be similarly covered by the technical scope of the present invention.

In accordance with the above-described embodiment, as previously explained, all of the terminal devices commonly used on the network, the connection
20 information of the peripheral device connected to the terminal devices, and the using status information thereof can be displayed on the display screen under easy observation condition and a discriminatable condition. As a result, all of the devices connected
25 to the network can be effectively utilized. Therefore, the work efficiency for using the peripheral device commonly used on the network can be increased.

Also, according to the embodiment, the condition of the image reading device commonly used on the network is acquired to be displayed on the image reading device selecting screen. As a consequence, the user can readily select the presently available image reading device, so that the work efficiency can be increased.

WHAT IS CLAIMED IS:

1. An information processing apparatus connected to a network, comprising:

communicating means for communicating information
5 with each of terminal devices on said network;

first acquiring means for acquiring information related to the terminal device connected to said network;

second acquiring means for acquiring information
10 related to a peripheral device which is locally connected to the terminal device whose information is acquired by said first acquiring means;

third acquiring means for acquiring a status of the peripheral device whose information is acquired by
15 said second acquiring means; and

display means for displaying information of a terminal device connected to said network, information of a peripheral device connected to said terminal device, and a status thereof based upon the information
20 acquired by said first acquiring means, the information acquired by said second acquiring means, and the status acquired by said third acquiring means.

2. An information processing apparatus according to claim 1 wherein:

said first acquiring means, said second acquiring means, and said third acquiring means poll the terminal

device on said network to acquire both the information and the status thereof every time a predetermined time period has passed; and

5 said display means updates the display content based upon said polling-acquired information and condition.

3. An information processing apparatus according to claim 1 wherein:

10 said first acquiring means, said second acquiring means, and said third acquiring means poll the terminal device on said network to acquire both the information and the status thereof in response to a predetermined operation made by a user; and

15 said display means updates the display content based upon said polling-acquired information and condition.

20 4. An information processing apparatus according to claim 1 wherein:

 said first acquiring means, said second acquiring means, and said third acquiring means receive and obtain both the information and the condition notified from the terminal device on said network; and

25 said display means updates the display content based upon said notified information and condition.

5. An information processing apparatus according to claim 1, further comprising:

selecting means for selecting a desirable peripheral device by a user from the peripheral devices displayed by said display means; and wherein:

a step-up operation for using the selected peripheral device is carried out in response to the selecting operation by the user via said selecting means.

10 6. An information processing apparatus according to claim 1 wherein:

said peripheral device is a printer device.

15 7. An information processing apparatus according to claim 1 wherein:

said peripheral device is a modem device.

8. An information processing apparatus according to claim 1 wherein:

20 said peripheral device is an image input device.

9. An information processing apparatus according to claim 1 wherein:

said first acquiring means acquires information of a terminal device within a predetermined network domain.

10. An information processing apparatus according

to claim 1 wherein:

said display means displays a terminal device and
a peripheral device, which are displayed, by way of
display elements; and also displays a connection
5 condition thereof by connecting the respective display
elements to each other on a display screen thereof.

11. An information processing apparatus according
to claim 10 wherein:

10 said display means displays thereon the connection
condition of said peripheral device based upon a sort
of lines used to connect the terminal device with the
peripheral device.

15 12. An information processing apparatus according
to claim 10 wherein:

when said display means displays the condition of
the peripheral device, said display means selects an
icon corresponding to said condition of the peripheral
20 device from a predetermined icon group to display said
selected icon.

13. An information processing apparatus according
to claim 12 wherein:

25 said icon group contains an icon for indicating
that a peripheral device is busy, and also another icon
for representing that a peripheral device is not under

use.

14. An information processing apparatus according to claim 12 wherein:

5 said icon group contains an icon for representing the condition of the peripheral device by way of a moving picture representation.

10 15. An information processing apparatus according to claim 12 wherein:

 said icon group contains an icon for representing the condition of the peripheral device by way of a mesh thereof.

15 16. An information processing apparatus according to claim 12 wherein:

 said icon group contains an icon for indicating that a driver program for controlling a peripheral device is not installed in the own device.

20

 17. An information processing apparatus connected to a network, comprising:

 first saving means for saving information of the own device on said network;

25 connecting means for locally connecting a peripheral device thereto;

 second saving means for saving information of said

peripheral device connected by said connecting means;

detecting means for detecting a condition of said peripheral device connected by said connecting means;

and transmitting means for transmitting the

5 information saved in said first saving means, the information saved in said second saving means, and the condition detected by said detecting means to another device in response to a request issued from said another device.

10

18. An information processing apparatus connected to a network, comprising:

first saving means for saving information of the own device on said network;

15 connecting means for locally connecting a peripheral device thereto;

second saving means for saving information of said peripheral device connected by said connecting means;

20 detecting means for detecting a condition of said peripheral device connected by said connecting means;

and transmitting means for transmitting the

information saved in said first saving means, the information saved in said second saving means, and the condition detected by said detecting means to another

25 device on said network in a periodic manner.

19. A system in which at least a first

information processing apparatus and a second
information processing apparatus are connected to a
network, wherein:

5 said first information processing apparatus is
 comprised of:

 first acquiring means for acquiring information
related to the first information processing apparatus
connected to said network;

10 second acquiring means for acquiring information
 related to a peripheral device which is locally
connected to the first information processing apparatus
whose information is acquired by said first acquiring
means;

15 third acquiring means for acquiring a status of
 the peripheral device whose information is acquired by
said second acquiring means; and

20 display means for displaying information of the
 first information processing apparatus connected to
said network, information of a peripheral device
connected to said first information processing
apparatus, and a status thereof based upon the
information acquired by said first acquiring means, the
information acquired by said second acquiring means,
and the status acquired by said third acquiring means;
25 and wherein:

 said second information processing apparatus is
comprised of:

first saving means for saving information of the
own device on said network;

connecting means for connecting a peripheral
device thereto;

5 second saving means for saving information of said
peripheral device connected by said connecting means;

detecting means for detecting a condition of said
peripheral device connected by said connecting means;

and transmitting means for transmitting the
10 information saved in said first saving means, the
information saved in said second saving means, and the
condition detected by said detecting means to said
first information processing apparatus.

15 20. A system according to claim 19 wherein:

 said first acquiring means, said second acquiring
means, and said third acquiring means poll the first
and second information processing apparatuses on said
network to acquire both the information and the status
20 thereof every time a predetermined time period has
passed; and

 said display means updates the display content
based upon said polling-acquired information and
condition.

25

21. A system according to claim 19 wherein:

 said first acquiring means, said second acquiring

means, and said third acquiring means poll the first
and second information processing apparatuses on said
network to acquire both the information and the status
thereof in response to a predetermined operation made
5 by a user; and said display means updates the
display content based upon said polling-acquired
information and condition.

22. A system according to claim 19 wherein:
10 said first acquiring means, said second acquiring
means, and said third acquiring means receive and
obtain both the information and the status notified
from the first and second information processing
apparatuses on said network; and
15 said display means updates the display content
based upon said notified information and condition.

23. A system according to claim 19, further
comprising:
20 selecting means for selecting a desirable
peripheral device by a user from the peripheral devices
displayed by said display means; and wherein:
a step-up operation for using the selected
peripheral device is carried out in response to the
25 selecting operation by the user via said selecting
means.

24. A system according to claim 19 wherein:
said peripheral device is a printer device.

5 25. A system according to claim 19 wherein:
said peripheral device is a modem device.

26. A system according to claim 19 wherein:
said peripheral device is an image input device.

10 27. A system according to claim 19 wherein:
both said first information processing apparatus
and said second information processing apparatus belong
to a predetermined network domain; and
said first acquiring means acquires information of
15 the first and second information processing apparatuses
within a predetermined network domain.

28. A system according to claim 20 wherein:
said display means displays the first/second
20 information processing apparatuses and the peripheral
device, which are displayed, by way of display
elements; and also displays a connection condition
thereof by connecting the respective display elements
to each other on a display screen thereof.

25

29. A system according to claim 28 wherein:
said display means displays thereon the connection

condition of said peripheral device based upon a sort of lines used to connect the terminal device with said peripheral device.

5 30. A system according to claim 28 wherein:

 when said display means displays the condition of the peripheral device, said display means selects an icon corresponding to said condition of the peripheral device from a predetermined icon group to display said
10 selected icon.

 31. A system according to claim 30 wherein:

 said icon group contains an icon for representing the condition of the peripheral device by way of a
15 moving picture representation.

 32. A system according to claim 30 wherein:

 said icon group contains an icon for representing the condition of the peripheral device by way of a mesh
20 thereof.

 33. A system according to claim 30 wherein:

 said icon group contains an icon for indicating that a peripheral device is busy, and also another icon
25 for representing that a peripheral device is not busy.

34. A system according to claim 30 wherein:
said icon group contains an icon for indicating
that a driver program for controlling a peripheral
device is not installed in the own device.

5

35. A system according to claim 30 wherein:
said peripheral device is a printer device; and
said icon group contains such an icon which
indicates that a plurality of print jobs are pending.

10

36. A method for displaying information of a
peripheral device locally connected to a terminal
device connected to a network, comprising the steps of:

acquiring first information related to the
15 terminal device connected to said network;
acquiring second information related to the
peripheral device that is locally connected to the
terminal device whose first information is acquired;

acquiring third information related to the
20 condition of the peripheral device whose second
information is acquired; and

displaying a connection status display indicative
of information of the terminal device connected to said
network, information of the peripheral device connected
25 to said terminal device, and the status thereof based
upon the first information, the second information, and
the third information.

37. A display method according to claim 36
wherein:

said first information, said second information,
and said third information are acquired by polling the
5 terminal device on said network to acquire both the
information and the status thereof every time a
predetermined time period has passed; and

the content of said connection status display is
updated by the display content based upon said polling-
10 acquired information and condition.

38. A display method according to claim 36
wherein:

said first information, said second information,
15 and said third information are acquired by polling the
terminal device on said network to acquire both the
information and the status thereof in response to a
predetermined operation made by a user; and the display
content of said connection status display is updated by
20 the display content based upon said polling-acquired
information and condition.

39. A display method according to claim 36,
further comprising the steps of:

25 receiving and obtaining said first information,
said second information, and said third information
notified from the terminal device on said network; and

updating the display content of the connection status display based upon said notified information and condition.

5 40. A display method according to claim 36, further comprising the step of:

 selecting a desirable peripheral device by a user from the peripheral devices displayed on said connection state display; and wherein:

10 a step-up operation for using the selected peripheral device is carried out in response to the selecting operation of the peripheral device by the user via said selecting means.

15 41. A display method according to claim 36 wherein:

 said peripheral device is a printer device.

20 42. A display method according to claim 36 wherein:

 said peripheral device is a modem device.

 43. A display method according to claim 36 wherein:

25 said peripheral device is an image input device.

 44. A display method according to claim 36

wherein:

said first information is acquired from a terminal device within a predetermined network domain.

45. A display method according to claim 36
5 wherein:

to display the connection status display, a terminal device and a peripheral device, which are displayed, are expressed by way of display elements; and also the connection status is displayed by
10 connecting the respective display elements to each other on a display screen thereof.

46. A display method according to claim 45
wherein:
15 the connection status of said peripheral device is displayed based upon a sort of lines used to connect the terminal device with the peripheral device.

47. A display method according to claim 45
20 wherein:
when the condition of the peripheral device is displayed, an icon corresponding to said condition of the peripheral device is selected from a predetermined icon group to display said selected icon, to display
25 the connection status display.

48. A display method according to claim 47

wherein:

said icon group contains an icon for representing the condition of the peripheral device by way of a moving picture representation.

5

49. A display method according to claim 47

wherein:

said icon group contains an icon for representing the condition of the peripheral device by way of a mesh thereof.

10

50. A display method according to claim 47

wherein:

said icon group contains an icon for indicating that a peripheral device is busy, and also another icon for representing that a peripheral device is not busy.

15

51. A display method according to claim 47

wherein:

said icon group contains an icon for indicating that a driver program for controlling a peripheral device is not installed in the own device.

20

52. A method for displaying information of a

peripheral device locally connected to an information processing apparatus connected with a network,

25

comprising the steps of:

 saving first information relating to the own
device on said network;

 saving second information relating to said
5 peripheral device locally connected thereto;

 detecting a condition of said peripheral device
connected thereto; and

 transmitting the first information, the second
information, and the condition of said peripheral
10 device to another device based upon a request issued
from another device on said network.

53. A method for displaying information of a
peripheral device locally connected to an information
15 processing apparatus connected with a network,
comprising the steps of:

 saving first information relating to the own
device on said network;

 saving second information relating to said
20 peripheral device locally connected thereto;

 detecting a condition of said peripheral device
connected thereto; and

 transmitting the first information, the second
information, and the condition of said device to
25 another device on said network in a periodic manner.

54. A method for displaying information of a

peripheral device locally connected to a terminal
device connected with a network, comprising the steps
of:

acquiring first information relating to a
5 information processing apparatus connected to said
network;

acquiring second information relating to the
peripheral device which is locally connected to the
terminal device whose first information is acquired;

10 acquiring third information related to a status of
the peripheral device whose second information is
acquired; and

displaying a connection status display indicative
of information of the terminal device connected to said
15 network, information of the peripheral device connected
to said terminal device, and a status thereof based
upon the first information, the second information, and
the third information in the first information
processing apparatus; and also comprising the steps of:

20 saving information of the own device on said
network;

saving information relating to said peripheral
device locally connected thereto;

25 detecting a condition relating to said peripheral
device connected by said connecting means; and

transmitting the information related to said own
device, the information related to said peripheral

device, and the condition of said peripheral device to said first information processing apparatus in a second information processing apparatus.

5 55. A display method according to claim 54 wherein;

 said first information, said second information, and said third information are acquired by polling the information processing apparatuses on said network to
10 acquire both the information and the status thereof every time a predetermined time period has passed; and

 the content of said connection status display is updated by the display content based upon said polling-acquired information and condition.

15 56. A display method according to claim 54 wherein;

 said first information, said second information, and said third information are acquired by polling the information processing apparatuses on said network to
20 acquire both the information and the status thereof in response to a predetermined operation made by a user; and the display content of said connection status display is updated by the display content based upon
25 said polling-acquired information and condition.

57. A display method according to claim 54

wherein:

said first information, said second information,
and said third information are acquired by receiving
both the information and the condition notified from
5 the first and second information processing apparatuses
on said network; and

the display content of said connection status
display is updated based on said notified information
and status.

10

58. A display method according to claim 5,
further comprising a step of:

selecting a desirable peripheral device by a user
from the peripheral devices displayed on said
15 connection status display, wherein:

a step-up operation for using the selected
peripheral device is carried out in response to the
selecting operation of the peripheral device by the
user via said selecting means.

20

59. A display method according to claim 54
wherein:

said peripheral device is a printer device.

25

60. A display method according to claim 54
wherein:

said peripheral device is a modem device.

61. A display method according to claim 54
wherein:

said peripheral device is an image input device.

5 62. A display method according to claim 54
wherein:

both said first information processing apparatus
and said second information processing apparatus belong
to a predetermined network domain; and

10 said first information processing apparatus
acquires said first information from an information
processing apparatus within said predetermined network
domain.

15 63. A display method according to claim 54
wherein:

to display the connection status display, the
information processing apparatuses and a peripheral
device, which are displayed, are represented by way of
20 display elements; and also the connection status is
displayed by connecting the respective display elements
to each other on a display screen thereof.

25 64. A display method according to claim 54
wherein:

the connection status of said peripheral device is
displayed based upon a sort of lines used to connect

the terminal device with the peripheral device.

65. A display method according to claim 54
wherein:

5 when the condition of the peripheral device is
displayed, an icon corresponding to said condition of
the peripheral device is selected from a predetermined
icon group to display said selected icon, to display
the connection status display.

10

66. A display method according to claim 65
wherein:

 said icon group contains an icon for representing
the condition of the peripheral device by way of a
15 moving picture representation.

67. A display method according to claim 65
wherein:

 said icon group contains an icon for representing
20 the condition of the peripheral device by way of a mesh
thereof.

68. A display method according to claim 65
wherein:

25 said icon group contains an icon for indicating
that a peripheral device is busy, and also another icon
for representing that a peripheral device is not busy.

69. A display method according to claim 65
wherein:

said icon group contains an icon for indicating
that a driver program for controlling a peripheral
5 device is not installed in the own device.

70. A display method according to claim 65
wherein:

said peripheral device is a printer device; and
10 said icon group contains such an icon that
indicates that a plurality of print jobs are pending.

71. A storage medium for storing thereinto a
computer program executed by a computer employed in an
15 information processing apparatus connected to a
network, wherein:

said computer program is comprised of:
a process operation for acquiring first
information related to a terminal device connected to
20 said network;

a process operation for acquiring second
information related to a peripheral device which is
locally connected to the terminal device whose first
information is acquired;

25 a process operation for acquiring third
information related to a status of the peripheral
device whose second information is acquired; and

a process operation for displaying a connection status display indicative of information of said terminal device connected to said network, information of the peripheral device connected to said terminal
5 device, and a status thereof based upon the first information, the second information, and the third information.

72. A storage medium according to claim 71
10 wherein:

said first information, said second information, and said third information are acquired by polling the terminal device on said network to acquire both the information and the status thereof every time a
15 predetermined time period has passed; and

the content of said connection status display is updated by the display content based upon said polling-acquired information and condition.

73. A storage medium according to claim 71
20 wherein:

said first information, said second information, and said third information are acquired by polling the terminal device on said network to acquire both the
25 information and the status thereof in response to a predetermined operation made by a user; and the display content of said connection status display is updated by

the display content based upon said polling-acquired information and condition.

74. A storage medium according to claim 71
5 wherein:

said first information, said second information,
and said third information are acquired by receiving
both the information and the status notified from the
terminal device on said network; and
10 a display content of said connection status
display is updated based upon said notified information
and said notified status.

75. A storage medium according to claim 71,
15 further comprising:

a process operation for selecting a desirable
peripheral device by a user from the peripheral devices
displayed on said connection status display; and
wherein:

20 step-up operation for using the selected
peripheral device is carried out in response to the
selecting operation of the peripheral device by the
user via said selecting means.

76. A storage medium according to claim 71
25 wherein:

said peripheral device is a printer device.

77. A storage medium according to claim 71
wherein:

said peripheral device is a modem device.

5 78. A storage medium according to claim 71
wherein:

said peripheral device is an image input device.

10 79. A storage medium according to claim 71
wherein:

said first information processing apparatus
acquires information of a terminal device within a
predetermined network domain.

15 80. A storage medium according to claim 71
wherein:

as to said connection status display, a terminal
device and a peripheral device, which are displayed,
are represented by way of display elements; and also a
20 connection condition thereof is displayed by connecting
the respective display elements to each other on a
display screen thereof.

25 81. A storage medium according to claim 80
wherein:

the connection condition of said peripheral device
are displayed by way of a sort of lines used to connect

the terminal device with the peripheral device.

82. A storage medium according to claim 80
wherein:

5 as to said connection status display, when the
condition of the peripheral device is displayed, an
icon corresponding to said condition of the peripheral
device is selected from a predetermined icon group to
display said selected icon.

10

83. A storage medium according to claim 82
wherein:

 said icon group contains an icon for representing
the condition of the peripheral device by way of a
15 moving picture representation.

84. A storage medium according to claim 82
wherein:

 said icon group contains an icon for representing
20 the condition of the peripheral device by way of a mesh
thereof.

85. A storage medium according to claim 82
wherein:

25 said icon group contains an icon for indicating
that a peripheral device is busy, and also another icon
for representing that a peripheral device is not busy.

86. A storage medium according to claim 82
wherein:

said icon group contains an icon for indicating
that a driver program for controlling a peripheral
5 device is not installed in the own device.

87. A storage medium for storing thereinto a
computer program executed by a computer employed in an
information processing apparatus connected to a
10 network, wherein:

said computer program is comprised of:

a process operation for saving first information
relating to the own device on said network;

a process operation for saving second information
15 relating to said peripheral device locally connected
thereto;

a process operation for detecting a condition of
said peripheral device connected thereto; and

a process operation for transmitting the first
20 information, the second information, and the detected
condition to another device based upon a request issued
from said another device on said network.

88. A storage medium for storing thereinto a
25 computer program executed by a computer employed in an
information processing apparatus connected to a
network, wherein:

said computer program is comprised of:

a process operation for saving first information relating to the own device on said network;

5 a process operation for saving second information relating to said peripheral device locally connected thereto;

a process operation for detecting a condition of said peripheral device connected thereto; and

10 a process operation for transmitting the first information, the second information, and the detected condition to another device on said network in a periodic manner.

2025 RELEASE UNDER E.O. 14176

ABSTRACT OF THE DISCLOSURE

An efficiency of a work by using a peripheral device commonly used, or shared on a network is increased. Information data is transmitted/received among a plurality of terminal devices connected to the network so as to acquire connection information of a peripheral device connected to the terminal devices, and also using status information of this peripheral device. Then, the acquired information is stored. Based upon the stored information, all of the terminal devices on the network, the connection information of the peripheral device connected to the terminal device, and the using status information of the peripheral device are displayed. As a result, all of the terminal devices on the network, the connection information of the peripheral device connected to the terminal device, and further the using status information of the peripheral device, which can be displayed on the display screen under easy observation condition.

FIG. 1

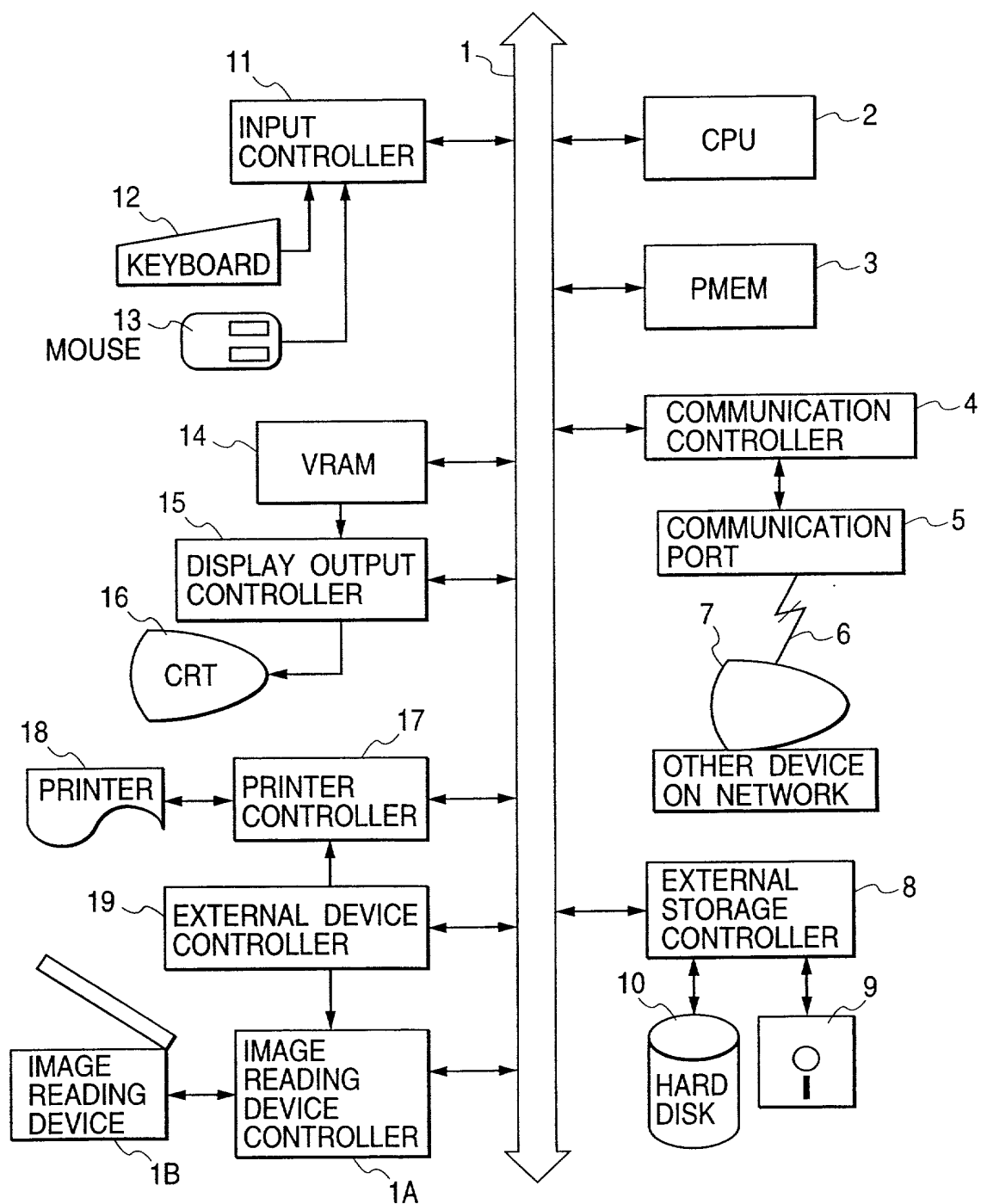


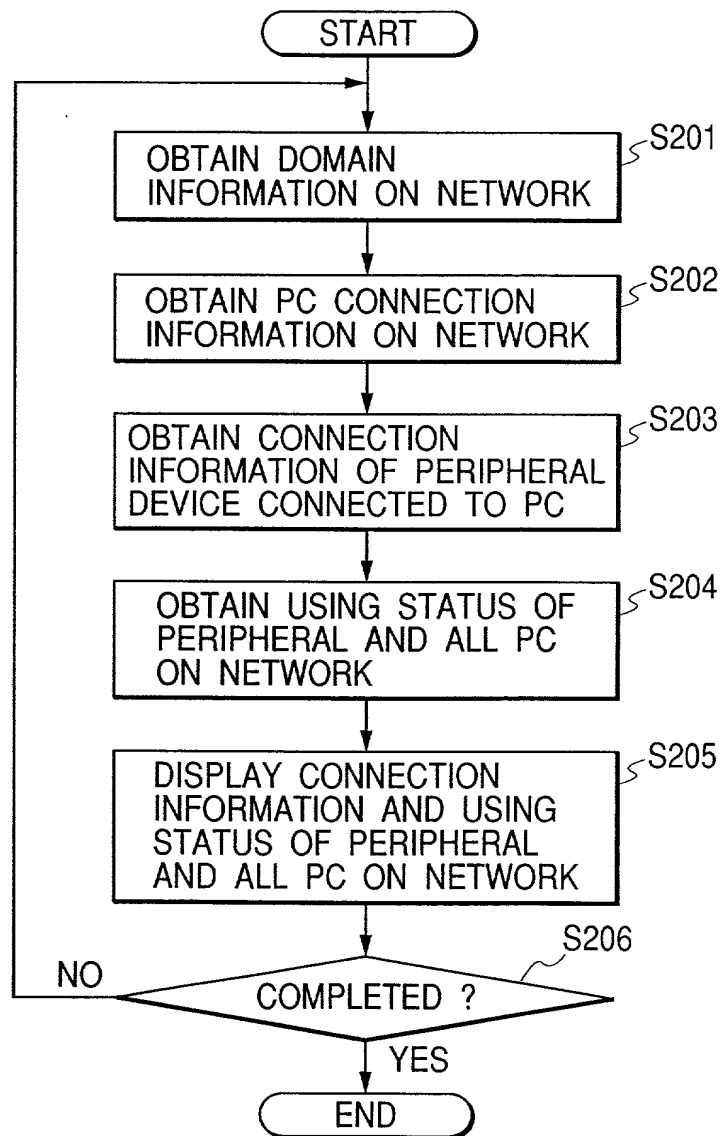
FIG. 2

FIG. 3

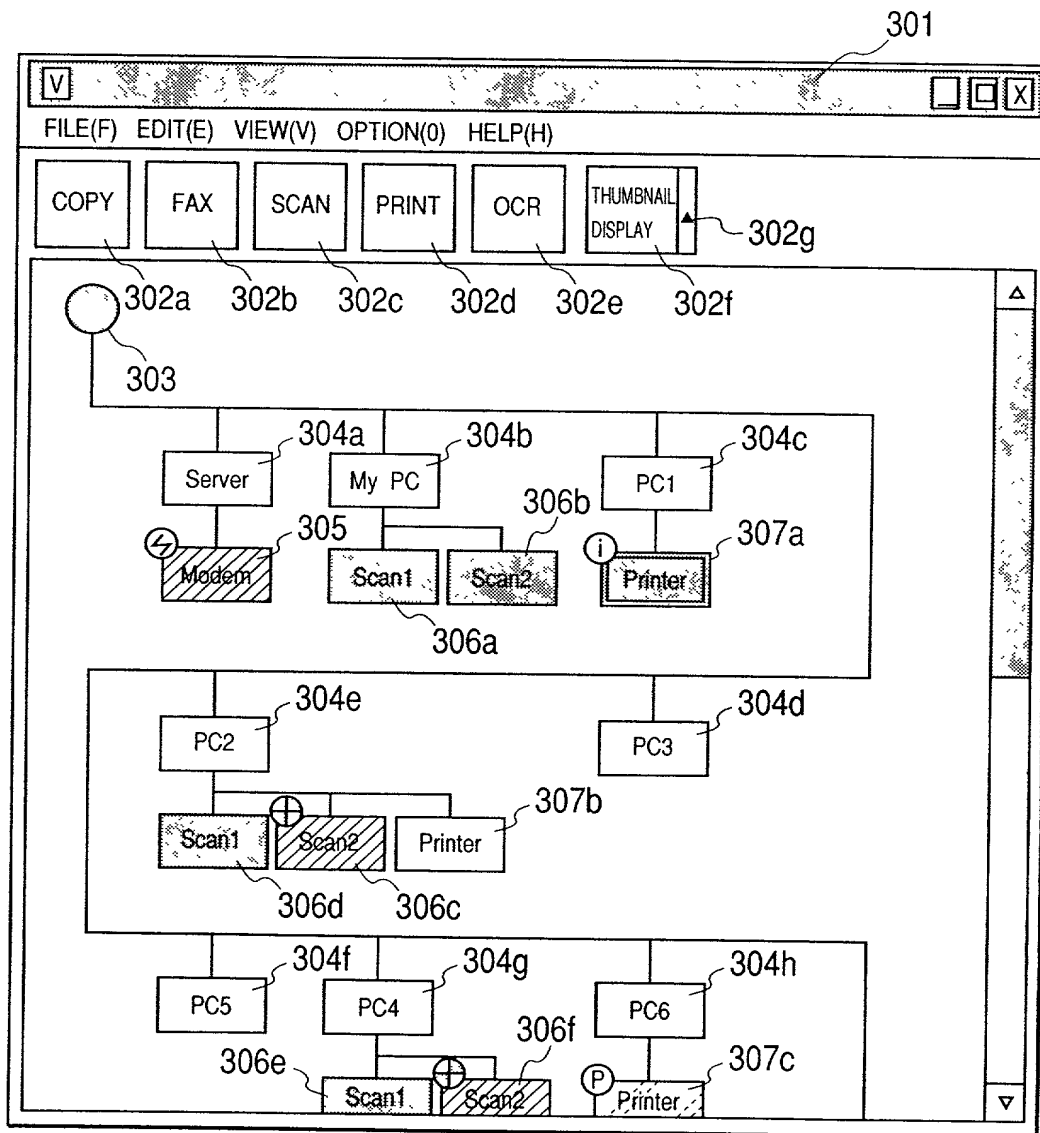


FIG. 5

51

INFORMATION UPDATE SET

SET NETWORK CONNECTION AND METHOD
OF UPDATING USING STATUS INFORMATION

52
☐

AUTO
UPDATE

53
☐

TIME SET

54
☒

INTERVAL
SET

5

MIN INTERVAL

55
☐

NONE

OK

CANCEL

FIG. 7

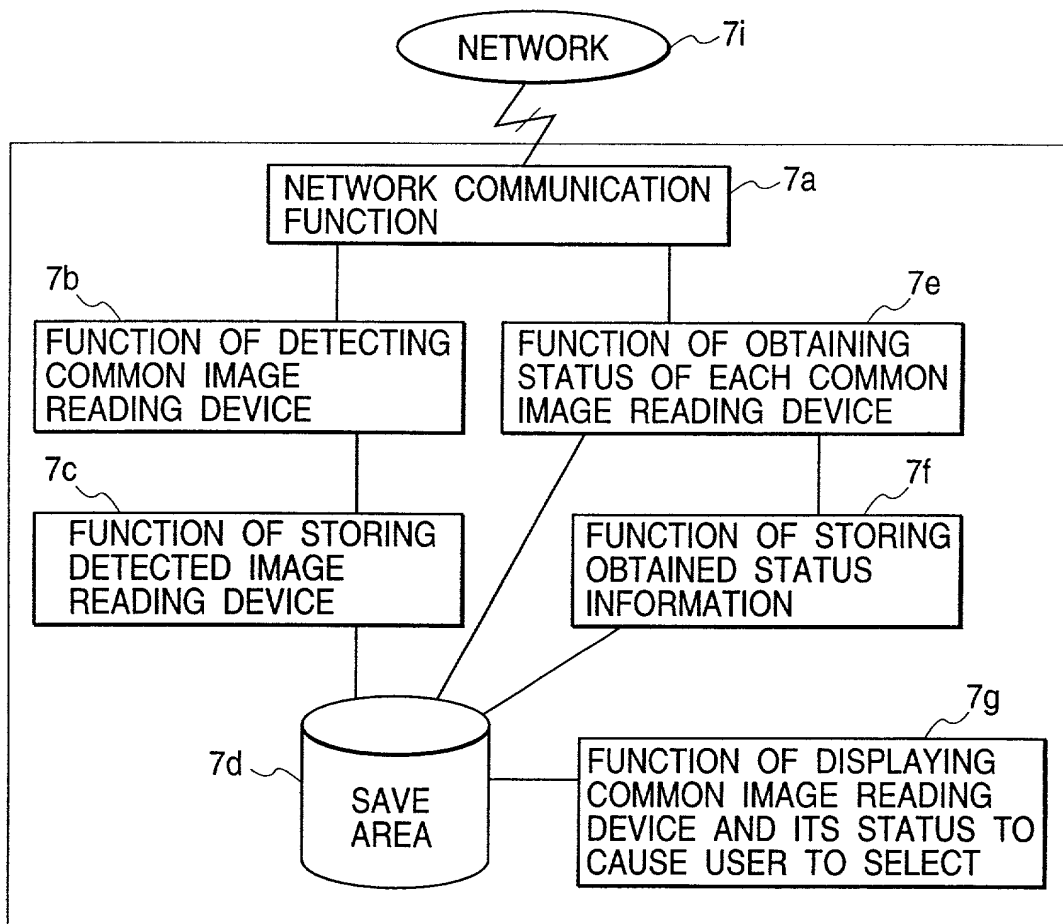


FIG. 8

IMAGE READING DEVICE SELECT

IMAGE READING DEVICE LIST

NAME	STATUS
IMAGE READING DEVICE 1	AVAILABLE
IMAGE READING DEVICE 2	BUSY
IMAGE READING DEVICE 3	POWER OFF

OK CANCEL

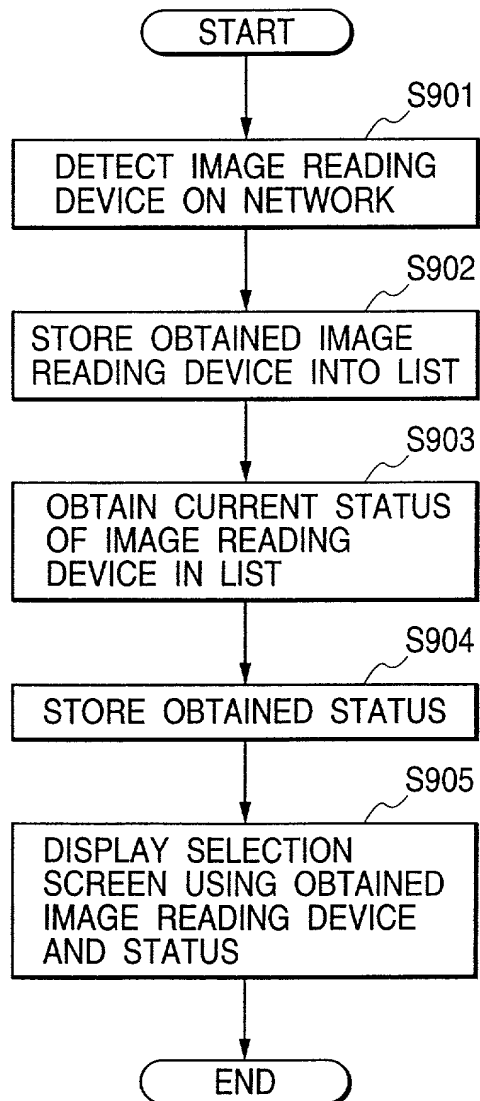
FIG. 9

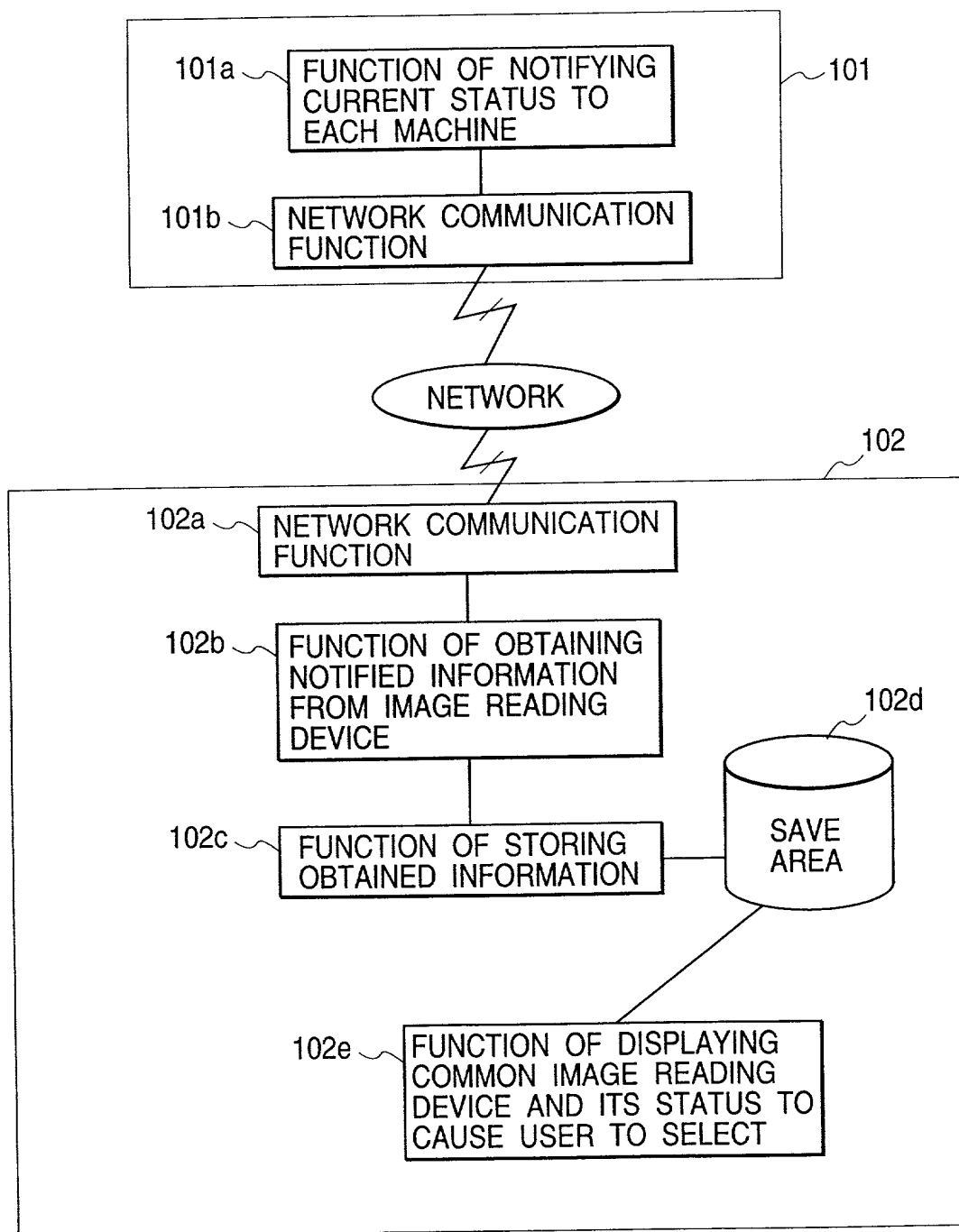
FIG. 10

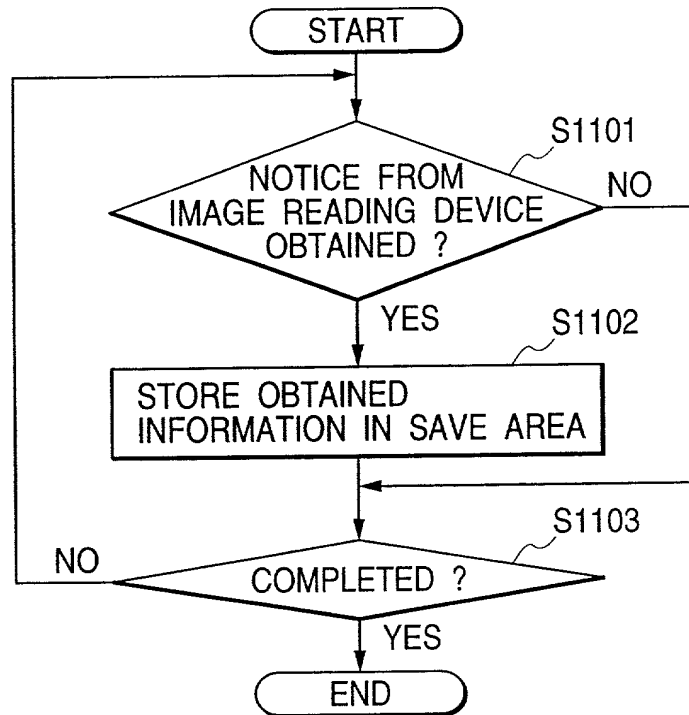
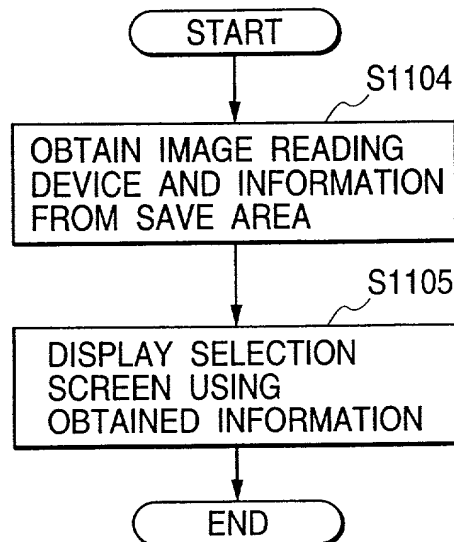
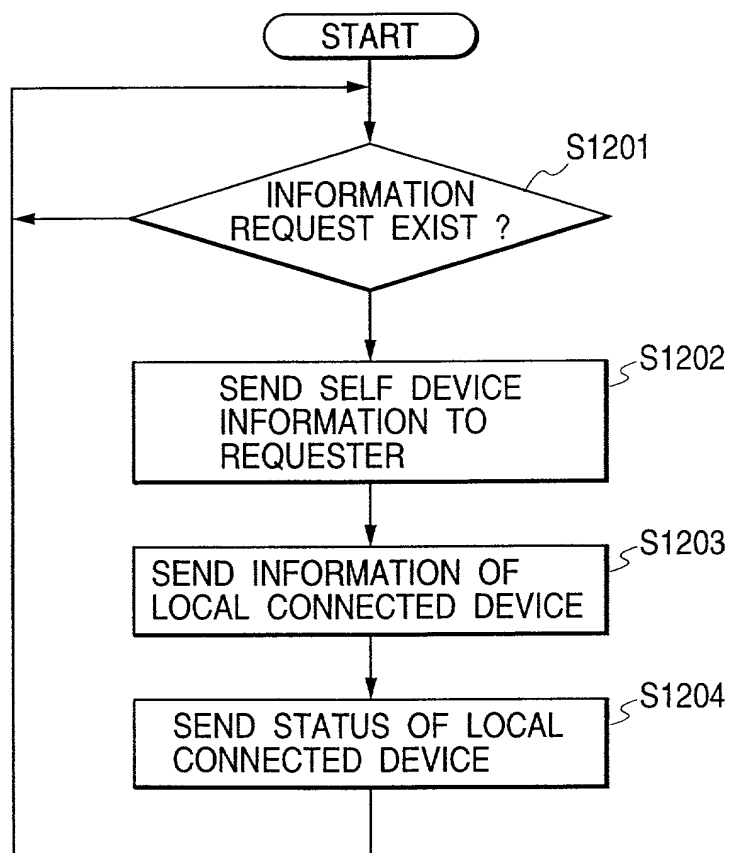
FIG. 11A**FIG. 11B**

FIG. 12

COMBINED DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION

(Page 1)

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

SYSTEM FOR DISPLAYING CONNECTION CONDITION OF DEVICE PROVIDED
ON NETWORK

the specification of which ☒ is attached hereto ☐ was filed on _____ as United States
Application No. or PCT International Application No. _____
and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or §365(b), of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT international application which designates at least one country other than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate, or PCT international application having a filing date before that of the application on which priority is claimed:

Country	Application No.	(Yes/No) Filed (Day/Mo./Yr.)	Priority Claimed
Japan	10-281303	October 2, 1998	Yes
Japan	10-284305	October 6, 1998	Yes

I hereby claim the benefit under 35 U.S.C. §120 of any United States application(s), or §365(c) of any PCT international application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

Application No.	Filed (Day/Mo./Yr.)	Status (Patented, Pending, Abandoned)
N/A		

I hereby appoint the practitioners associated with the firm and Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and direct that all correspondence be addressed to the address associated with that Customer Number:

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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